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Programmers are writing a large and rapidly growing number of programs in object-oriented languages such as Java that require garbage collection (GC). To explore the design and evaluation of GC algorithms quickly, researchers are using simulation based on traces of object allocation and lifetime behavior. The

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Page(s): 262 -269

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Optimizing dynamic memory management in a multithreaded application executing on a multiprocessor

Haggander, D. Lundberg, L.

Ericsson Software Technol. AB, Karlskrona;

*This paper appears in: **Parallel Processing, 1998. Proceedings. 1998 International Conference on***

Meeting Date: 08/10/1998 -08/14/1998

Publication Date: 10-14 Aug 1998

Location: Minneapolis, MN , USA

On page(s): 262-269

References Cited: 13

IEEE Catalog Number: 98EX205

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INSPEC Accession Number: 6034718

Abstract:

The Billing Gateway (BGw) is a large multithreaded object oriented C++ appli running on Sun Solaris. Due to frequent allocation and deallocation of dynami memory, the initial implementation of this system suffered from poor perform when executed on a multiprocessor. We compare two approaches for improv performance of BGw. First we replace the standard Solaris heap with a paralle heap. In the second approach we optimize the application code by removing a number of heap allocations/deallocations. In order to do this, we introduce m pools for commonly used object types and replace some heap variables with s variables. The parallel heap approach resulted in a dramatic speedup improve The optimization of the application code did also result in a dramatic speedup improvement. For this approach the performance using a single processor computer was also increased by a factor of eight. The optimizations took approximately one week to implement

Index Terms:

data structures multiprocessing systems object-oriented programming storage allocat storage management Billing Gateway Sun Solaris commonly used object types dyna memory allocation dynamic memory management optimization heap allocations/deallocations heap variables large multithreaded object oriented C++ applic memory pools multiprocessor multithreaded application parallel heap parallel heap approach single processor computer stack variables standard Solaris heap

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Page(s): 262 -269

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2 A hardware implementation of realloc function
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Page(s): 106 -111

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Page(s): 49 -56

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Page(s): 274 -281 vol.1

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Page(s): 513 -517 vol.1

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Page(s): 6 -12 vol.1

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Page(s): 101 -110

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